

REMARKS

Reconsideration of the application is respectfully requested for the following reasons:

1. Requirement for Information Under 37 CFR §105

This requirement has been addressed by attaching the two articles listed on the PTO-1449 form. These articles are cited solely as background.

The article entitled “*Networking Technology and DIS*” provides general information on distributed interactive simulation, while the article entitled “*An Auto-adaptive Dead Reckoning Algorithm for Distributed Interactive Simulation*” provides a more specific explanation of **(a) updating the virtual reality environment; (b) defining areas of interest; and (c) dividing the areas of interest**, as required in item 2 on page 2 of the Official Action.

It is noted that the specific technique of dividing the virtual scene and block in an “**interlaced**” square division manner has been deleted from the claims.

2. Formalities

The specification and abstract have been revised to place the application in proper U.S. format and to correct various minor grammatical and idiomatic errors, including those noted in item 6 on page 2 of the Official Action.

Claim 1 has been amended to include the limitations of allowable claim 4, claim 5 has been re-written in independent form as new claim 6 (which includes the limitations or original claims 1 and 5), and each of the claims has been reviewed and amended as necessary to correct informalities, including those noted in item 10 on page 4 of the Official Action.

Because the changes are all formal in nature, it is respectfully submitted that the changes do not involve new matter.

3. Objection to Drawings Under 37 CFR §1.83(a)

This objection has been addressed by adding a new Fig. 3, attached. New Fig. 3 shows a conventional network, such as the Internet, and indicates the transmission of the messages by arrows and blocks 34. The specification has also been amended by adding reference numeral 34 to indicated the “messages” described in the original specification.

Because transmission of messages updating virtual reality are known, as indicated by the references attached to this response, and because Fig. 3 simply depicts a conventional network such as the Internet using arrows and blocks to indicate transmission of messages in known manner, it is respectfully submitted that Fig. 3 does not introduce “new matter,” and approval of new Fig. 3 is therefore respectfully requested.

4. Rejection of Claims 1 and 3 Under 35 USC §112, 1st Paragraph

The rejection of claim 3 under 35 USC §112, 1st Paragraph, has been rendered moot by the cancellation of claim 3.

The rejection of claim 1 (which now includes the limitations of original claim 4) under 35 USC §112, 1st Paragraph is respectfully traversed on the grounds that transmission of an updating message in a distributed virtual reality simulation is known to those skilled in the art, as evidenced by the two articles attached to this response. In fact, such updating is essential to distributed virtual reality simulation, and the present invention involves an improvement on the particular “dead reckoning” and timer technique described in the introductory portion of the present specification.

Basically, the invention involves carrying out virtual reality simulations at different locations, so that actions and events at one location affect the “virtual reality” perceived at other locations. These actions or events are transmitted to other locations in the form of “messages” that are transmitted over a network. The problem addressed by the articles, and also by the claimed invention, is essentially one of bandwidth, and the general approach to reducing the

bandwidth is to only transmit information to a particular location that will be of interest to participants at that location. For example, as explained in the “Dead Reckoning” article, one can determine whether a particular action will have an effect in different “areas of interest” within the simulation by extrapolating data concerning the action that occurs in a particular area of interest. Only data necessary to carrying out the extrapolation needs to be transmitted in a message, thereby reducing bandwidth.

The specific improvement recited in claim 1 concerns the timing of update transmission over the network to other participants in the simulation. It does so by taking into account the presence of a participant in relation to neighboring “subblocks” of a defined block. Transmission of data is carried out only when enough actions or events have occurred to cause a predetermined amount of “inconsistency” in the areas of interest. This reduces bandwidth requirements by ensuring that transmission occurs only when necessary to inform other participants of actions that are likely to affect the other participants. Claim 6 (original claim 5) concerns the threshold that determines the level of inconsistency necessary to trigger a transmission.

As is apparent from the above, the claimed invention can utilize conventional message transmission techniques, as well as conventional techniques for dividing a virtual reality environment into blocks that define areas of low and high interest. What the claimed invention does is to set criteria for when to send the updating message, not the format or manner in which the message is transmitted. Therefore, it is respectfully submitted that those skilled in the art could easily have implemented the invention based on knowledge of the standard techniques described in the two articles attached hereto, and withdrawal of the rejection of claim 1 under 35 USC §112, 1st Paragraph is respectfully requested.

3. Rejection of Claims 6-10 and 17-19 Under 35 USC §112, 2nd Paragraph

This rejection has been addressed by amending the portion of claim 1 imported from original claim 4 to refer to elapsing of a time value, and to delete the term relatively.

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4. Rejection of Claims 1-3 Under 35 USC §103(a) in view of the Culler and Leiserson Articles

This rejection has been rendered moot by the inclusion, in claim 1, of the subject matter of original claim 4, and by re-writing claim 5 in independent form as new claim 6.. Claims 4 and 5 were indicated as allowable in item 17 on page 8 of the Official Action.

Having thus overcome each of the rejections made in the Official Action, withdrawal of the rejections and expedited passage of the application to issue is requested.

Respectfully submitted,

BACON & THOMAS, PLLC

A handwritten signature in black ink, appearing to be 'B. Urcia', with a long horizontal line extending to the right.

By: BENJAMIN E. URCIA
Registration No. 33,805

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BACON & THOMAS, PLLC
625 Slaters Lane, 4th Floor
Alexandria, Virginia 22314

Telephone: (703) 683-0500

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